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**NITROGEN**

**PHOSPHATE**

**POTASH**

# **THE FERTILIZER SUPPLY 1975-76**



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## SUMMARY

Net domestic supplies of fertilizer plant nutrients in the 1975-76 fertilizer year are expected to total 20.3 million tons - nitrogen (N), phosphate ( $P_2O_5$ ), and potash ( $K_2O$ ). This is 2 percent more than last year's supply but 5 percent less than 2 years ago.

Estimated supplies of N total 9,868,000 tons, up 3 percent from last year and about the same as 2 years ago. Curtailment of natural gas supplies for anhydrous ammonia plants has not been as severe as anticipated at the beginning of the year. Production of nitrogenous fertilizers for which anhydrous ammonia is the basic raw material is expected to continue at levels slightly above last year.

Phosphate supplies are expected to total 5,732,000 tons of  $P_2O_5$ , up 13 percent from a year ago and 2 percent more than 2 years ago. Movement of phosphatic materials during the second half of the fertilizer year will determine if production can be maintained or increased above the rate of the first half of the year.

Potash supplies are expected to total 4,680,000 tons of  $K_2O$ , 12 percent less than a year ago and 19 percent less than 2 years ago. Imports of potassium chloride, primarily from Canada, are expected to supply about 77 percent of needs for this material. Supply from domestic production is expected to be 12 percent less than last year. Potassium sulfate supplies are expected to be down 6 percent from year-ago levels.

Beginning inventories on July 1, 1975 were at record levels for virtually all kinds of fertilizer. Production rates the first 6 months were influenced by inventory levels. This has made it possible for companies to do maintenance work and repairs on plants which had been postponed where possible during the fertilizer shortage period of recent years.

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1/ The fertilizer year is from July 1 through June 30.

## NITROGEN (N)

Net domestic supplies of nitrogen (N) for fertilizer use are expected to total 9,868,000 tons in the 1975-76 fertilizer year. This is about 3 percent more than was available last year and the same as 2 years ago (table 1). Supplies from domestic production are estimated to be up about 5 percent over last year, with imports down about 15 percent and exports up about 2 percent.

Supply from domestic production - Supplies of nitrogen (N) from domestic production are expected to total 9,981,000 tons (table 1). The supply of liquid nitrogen, estimated to be about two-thirds of the total domestic supply of N, is expected to be 6,552,000 tons, up 2 percent over last year. Anhydrous ammonia shipped as such for fertilizer use is expected to be up about 1 percent over last year. Production of all other liquid nitrogen indicates an increase of about 5 percent.

Domestic production of solid nitrogen is estimated to total 3,429,000 tons in the current fertilizer year, up 10 percent over a year ago. Ammonium nitrate supplies are expected to be up about 1 percent from last year, ammonium sulfate up 14 percent, and solid urea for fertilizer use down about 3 percent. Other solid nitrogen-bearing materials, largely ammonium phosphates, are estimated to be up about 31 percent from last year.

Imports - Total nitrogen imports for the fertilizer year are estimated to be about 1,024,000 tons of N, 15 percent less than in 1974-75. This will again put the United States in the position of being a net exporter. Imports of sodium nitrate are expected to be down 25 percent and ammonium nitrate down about 40 percent. Anhydrous ammonia imports are estimated to be up about 20 percent over last year, with urea imports down about 52 percent.

Exports - Nitrogen exports will total around 1,137,000 tons of N, about 2 percent more than last year. Anhydrous ammonia exports are expected to be down 37 percent from last year. Ammonium nitrate and ammonium sulfate exports are both expected to be up about 29 percent. Urea exports are also expected to be up about 49 percent, while all other materials are expected to be down 2 percent.

Nitrogen capacities - Domestic anhydrous ammonia capacity was estimated at 18.8 million tons of anhydrous ammonia (NH<sub>3</sub>) on January 1, 1976, up from 17.5 million tons in 1975. Some of the projects included in the previously announced 8-million-ton expansion of anhydrous ammonia capacity (from January 1, 1975 to January 1, 1979) have been cancelled, became questionable, or have been delayed. Currently, the expansion during this 4-year period is estimated to be about 6.5 million tons.



Table 1.--Nitrogen: Estimated supply of N for fertilizer purposes,  
United States, fertilizer years, 1973-74, 1974-75, and 1975-76

Item	1973-74 <u>1/</u>	1974-75 <u>1/</u>	1975-76	Percent change in 1975-76 from	
				1974-75	1973-74
	1,000 <u>Short tons</u>	1,000 <u>Short tons</u>	1,000 <u>Short tons</u>	<u>Percent</u>	<u>Percent</u>
Supply from domestic production:					
Liquids:					
Ammonia (including aqua)	4,256	4,044	4,068	+ 1	- 4
All other	2,249	2,355	2,484	+ 5	+ 10
Total liquids	6,505	6,399	6,552	+ 2	+ 1
Solids:					
Ammonium nitrate <u>2/ 3/</u>	1,351	1,189	1,198	+ 1	- 11
Ammonium sulfate <u>3/</u>	574	485	552	+ 14	- 4
Urea	586	568	552	- 3	- 6
All other solids <u>4/</u>	1,078	862	1,127	+ 31	+ 5
Total solids	3,589	3,104	3,429	+ 10	- 4
Total liquids and solids	10,094	9,503	9,981	+ 5	- 1
Imports:					
Ammonia (including aqua)	359	491	589	+ 20	+ 64
Nitrogen solutions	50	28	41	+ 46	- 18
Ammonium nitrate	101	106	63	- 40	- 38
Ammonium sulfate	57	52	35	- 33	- 39
Urea <u>3/</u>	240	291	140	- 52	- 42
Sodium nitrate	16	32	24	- 25	+ 50
All other	245	198	132	- 33	- 46
Total	1,068	1,198	1,024	- 15	- 4
Exports:					
Ammonia (including aqua)	527	294	185	- 37	- 65
Ammonium nitrate	12	7	9	+ 29	- 25
Ammonium sulfate	117	118	152	+ 29	+ 30
Urea	148	207	308	+ 49	+108
All other	465	492	483	- 2	+ 4
Total	1,269	1,118	1,137	+ 2	+ 10
Net domestic supply	9,893	9,583	9,868	+ 3	+ 0

1/ Revised.

2/ Includes ammonium nitrate and ammonium nitrate-limestone mixtures.

3/ Adjusted for estimated quantity going into nonfertilizer uses.

4/ To avoid duplication, the figure for "all other solids" has been adjusted by the estimated amount of imported ammonia used in primary materials.

Urea capacity is estimated to be 6 million tons of material, an increase of 1.1 million tons within the past year. Ammonium nitrate capacity is estimated to be 8.4 million tons. About 1.2 million tons of ammonium nitrate is used to produce industrial material. The 7.2 million tons which is used for making fertilizer grade material is divided into about 54 percent solid and 46 percent liquid.

### PHOSPHATE ( $P_2O_5$ )

Net domestic supplies of phosphate ( $P_2O_5$ ) are expected to total 5,732,000 tons in the 1975-76 fertilizer year, about 13 percent more than was available last year and 2 percent more than 2 years ago (table 2). Imports are estimated to be 194,000 tons of  $P_2O_5$ , down 29 percent from 1974-75 and down 38 percent from 1973-74. Exports are expected to be 1,850,000 tons of  $P_2O_5$ , down 2 percent from a year ago and up 17 percent over 1973-74.

Normal superphosphate - Total supplies of normal and enriched superphosphate from domestic production are estimated to be 439,000 tons of  $P_2O_5$ , about 29 percent less than last year (table 2). Imports will be negligible. Exports are expected to total about 5,000 tons of  $P_2O_5$ , compared with 4,000 tons last year.

Concentrated superphosphate - Supplies of concentrated superphosphate from domestic production are expected to total 1,717,000 tons of  $P_2O_5$ , 9 percent more than last year. Imports are estimated to be down about 69 percent from last year. Exports are expected to be down about 27 percent.

Ammonium phosphate - Domestic supplies of ammonium phosphate are expected to total 3,514,000 tons of  $P_2O_5$ , 37 percent more than in 1974-75, and 25 percent more than 2 years ago. Imports are estimated to be up about 25 percent from last year, and exports up about 11 percent.

Phosphoric acid - Wet-process phosphoric is the basic  $P_2O_5$  material used in the manufacture of high-analysis phosphatic fertilizers. Production of this acid is up over last year. The rate of use in concentrated phosphatic fertilizer materials and shipments to other fertilizer producers for further processing during the second half of the 1975-76 fertilizer year will determine if production can be maintained or increased above the rate of the first half.

Supplies of phosphoric acid available for sale (estimated to be about 25 percent of production) to primary fertilizer producers without phosphoric acid facilities, and to secondary fertilizer producers, continues to be a major segment of the total  $P_2O_5$  supply. Secondary manufacturers use phosphoric acid to produce solid mixtures, solid



N-P base materials (including ammonium phosphate), liquid N-P base materials (including ammonium phosphate and ammonium polyphosphate), liquid mixed fertilizers, and for direct application.

Phosphate capacities - Normal superphosphate capacity in operating plants is estimated to be about 716,000 tons of  $P_2O_5$ . Concentrated superphosphate capacity is estimated to be 2.7 million tons of  $P_2O_5$ .

Ammonium phosphate capacity in plants operated by primary producers is estimated to be about 4.9 million tons of  $P_2O_5$ , up from 4 million tons last year. Available information is not sufficient to reliably estimate capacity of other plants operated by secondary producers which manufacture ammonium phosphate primarily for their own use in mixed fertilizers (solid and liquid) and liquid ammonium polyphosphate.

Wet-process phosphoric acid capacity in operating plants is estimated to be 9 million tons of  $P_2O_5$ , compared to 6.9 million tons a year ago. Some of the new jumbo plants are not yet operating at rated capacity.

The above estimates of  $P_2O_5$  capacities are based on current production of phosphatic materials. However, capacities may shift within limits from one material to another, since phosphoric acid is the basic  $P_2O_5$  source for the production of all concentrated phosphatic materials except nitric phosphate.

Within limits, market conditions govern division of the output of phosphoric acid into concentrated superphosphate, various grades of ammonium phosphate, liquid base N-P materials, or sales of phosphoric acid to secondary fertilizer manufacturers.

#### POTASH ( $K_2O$ )

Net domestic supplies of potash ( $K_2O$ ) in 1975-76 are expected to total 4,680,000 tons, 12 percent less than last year and 19 percent less than 2 years ago (table 3). Imports are expected to be 3,431,000 tons of  $K_2O$ , down 11 percent from 1974-75. Exports are expected to be 817,000 tons of  $K_2O$ , down 4 percent.

Potassium chloride - Supplies of domestically produced potassium chloride (muriate of potash) are expected to total 1,624,000 tons of  $K_2O$ , (table 3), about 13 percent less than last year and 25 percent less than 2 years ago. Imports are expected to be down about 11 percent, and exports down 4 percent. Subtracting exports from domestic production indicates that only 23 percent of the net domestic supply will be from domestic production. Practically all of the remaining 77 percent will be imported from Canada.

Table 2.—Phosphate: Estimated supply of  $P_2O_5$  for fertilizer purposes,  
United States, fertilizer years, 1973-74, 1974-75, and 1975-76

Item	1973-74 <sup>1/</sup>	1974-75 <sup>1/</sup>	1975-76	Percent change in 1975-76 from	
				1974-75	1973-74
	<u>1,000 Short tons</u>	<u>1,000 Short tons</u>	<u>1,000 Short tons</u>	<u>Percent</u>	<u>Percent</u>
Supply from domestic production:					
Normal and enriched superphosphate	673	612	439	- 29	- 35
Concentrated superphosphate	1,714	1,569	1,717	+ 9	0
Ammonium phosphate <sup>2/</sup>	2,818	2,572	3,514	+ 37	+ 25
All other <sup>3/</sup>	1,664	1,916	1,718	- 10	+ 3
Total	6,869	6,669	7,388	+ 11	+ 8
Imports:					
Concentrated superphosphate	32	26	8	- 69	- 75
Ammonium phosphate	171	106	133	+ 25	- 22
All other	112	142	53	- 63	- 53
Total	315	274	194	- 29	- 38
Exports:					
Normal superphosphate	5	4	5	+ 25	0
Concentrated superphosphate	440	502	368	- 27	- 16
Ammonium phosphate	963	1,003	1,118	+ 11	+ 16
All other	173	373	359	- 4	+108
Total	1,581	1,882	1,850	- 2	+ 17
Net domestic supply	5,603	5,061	5,732	+ 13	+ 2

<sup>1/</sup> Revised.

<sup>2/</sup> Liquid and solid ammonium phosphate, excluding those combined with potash salts in the process of manufacture.

<sup>3/</sup> Includes nitric phosphates, sodium phosphate, wet base goods, natural organics, phosphate rock, colloidal phosphate, basic slag, estimates of wet-process and furnace phosphoric acid for liquid and solid mixed fertilizers, and direct application, and ammonium phosphates combined with potash salts in the process of manufacture.

Table 3.—Potash: Estimated supply of K<sub>2</sub>O for fertilizer purposes,  
United States, fertilizer years, 1973-74, 1974-75, and 1975-76

Item	1973-74 <u>1/</u>	1974-75 <u>1/</u>	1975-76	Percent change in 1975-76 from	
				1974-75	1973-74
	<u>1,000 Short tons</u>	<u>1,000 Short tons</u>	<u>1,000 Short tons</u>	<u>Percent</u>	<u>Percent</u>
Supply from domestic production:					
Potassium chloride	2,181	1,860	1,624	- 13	- 25
Potassium sulfate <u>2/</u>	388	409	407	0	+ 5
All other	35	35	35	0	0
Total	2,604	2,304	2,066	- 10	- 21
Imports:					
Potassium chloride	4,029	3,785	3,362	- 11	- 17
Potassium sulfate <u>2/</u>	37	25	39	+ 56	+ 5
All other	48	40	30	- 25	- 37
Total	4,114	3,850	3,431	- 11	- 17
Exports:					
Potassium chloride	771	619	594	- 4	- 23
Potassium sulfate <u>2/</u>	136	175	208	+ 19	+ 53
All other	40	54	15	-178	- 62
Total	947	848	817	- 4	- 14
Net domestic supply	5,771	5,306	4,680	- 12	- 19

1/ Revised.

2/ Includes potassium-magnesium sulfate.

Potassium sulfate - Supplies of potassium sulfate and potassium magnesium sulfate from domestic production are expected to total 407,000 tons of  $K_2O$  in 1975-76, about the same as last year and 5 percent more than 2 years ago. Imports are expected to be up about 56 percent and exports up about 19 percent.

Potash capacities - U.S. potash production capacity is estimated to be 3.3 million tons of  $K_2O$  as of January 1, 1976, according to the Bureau of Mines.

Canadian capacity is estimated to be about 8.3 million tons of  $K_2O$ . The Provincial Government of Saskatchewan has proposed, and authorizing legislation has been passed, to nationalize at least a part of the potash industry in the Province. Currently, the intentions of the Provincial Government are unclear.

### INVENTORIES

Inventories of nitrogen and phosphate materials are reported monthly by the Bureau of the Census. Inventories of each nitrogenous material are stocks held by producing companies at plants and other locations.

Phosphate material inventories are the stocks at producing locations only. Monthly potash inventories are not available from Government sources. Data are not available on inventories held by secondary manufacturers, distributors, and dealers.

Nitrogen - The inventory of anhydrous ammonia at the end of June 1975 was 1,131,500 tons, a new record for June (table 4). This was up nearly 84 percent from June 1974 and up 14 percent from the previous record high set in June 1972. The inventory of anhydrous ammonia at the end of December 1975, the middle of the current fertilizer year, was 1,948,315 tons--up about 71 percent from December 1974, and up about 127 percent over the very low level 2 years ago.

Stocks of ammonium nitrate and nitrogen solutions in June 1975 were at record levels for this date while ending stocks of ammonium sulfate were the highest in 5 years. December ending inventories of other nitrogenous materials were the highest in 4 to 5 years.

Phosphate - The June 1975 wet-process phosphoric acid inventory was 59 percent above 1974 and more than double the inventory in 1973 (table 4).

June 1975 stocks of total phosphates set a record level at 649,644 tons, nearly 150 percent over 1974. June inventories of normal and concentrated superphosphates were near record levels set in 1968 and 1967, respectively.



Table 4.--Inventories of selected fertilizer materials, United States, end of June, December, and February 1/

Material	Unit	Beginning inventory			Mid-fertilizer year inventory			Inventory build-up for spring season	
		For end of June			For end of December			For end of February	
		1973	1974	1975	1973	1974	1975	1974	1975
Anhydrous ammonia	Tons of material	622,318	615,376	1,131,500	857,284	1,138,280	1,948,315	1,116,823	1,555,315
Ammonium nitrate, solid	"	27,824	48,801	224,584	159,749	259,046	376,146	149,087	250,320
Ammonium sulfate	"	62,508	139,496	172,753	113,602	122,691	288,714	200,754	184,515
Ammonium sulfate coke oven	"	39,000	14,000	67,000	30,000	23,000	11,000	26,000	27,000
Nitrogen solutions	Tons of N	97,330	79,836	225,166	309,483	323,411	405,417	244,250	315,211
Phosphoric acid wet-process	Tons of P <sub>2</sub> O <sub>5</sub>	79,435	118,195	188,335	87,121	166,042	218,386	112,561	153,654
Total phosphates	"	297,553	260,493	649,644	332,243	377,137	532,677	298,291	430,904
Normal & enriched superphosphates	"	52,625	53,927	100,648	66,846	78,310	74,945	66,410	99,607
Concentrated superphosphates	"	103,960	95,016	254,029	108,290	163,618	168,699	111,278	171,202
Ammonium phosphates	"	135,018	95,773	263,300	136,784	116,486	254,493	106,243	137,276
Other phosphates	"	5,920	15,777	31,667	20,323	18,723	34,540	14,360	22,799

1/ Current Industrial Reports, Inorganic Fertilizer Materials and Related Acids, M28B, Bureau of the Census.



## FOREIGN TRADE IN FERTILIZER

U.S. imports Seventy-five percent of total fertilizer imports came from Canada in 1974-75 (table 5). Over three-fourths of this was potassium chloride. U.S. companies, or their subsidiaries in Canada, and subsidiaries of Canadian companies in the United States, are responsible for a large share of the imports. Countries other than Canada are the major source for imported ammonium nitrate-limestone, anhydrous ammonia, calcium nitrate, potassium nitrate, potassium-sodium nitrate, potassium sulfate, and sodium nitrate. Mexico continues to be the major import source of phosphoric acid.

Imports of ammonium nitrate, anhydrous ammonia, calcium cyanamide, sodium nitrate, urea, phosphoric acid, and mixed fertilizer showed gains in 1974-75 over the previous year (table 6). Urea imports have increased nearly 2.5 times over the last 5 years. Imports of potassium chloride decreased 6 percent from 1973-74, the first decline in imports of this material since 1970-71. In 1974-75, there was also a significant decrease in imports of calcium nitrate, nitrogen solutions, synthetic nitrogenous material not elsewhere classified, ammonium phosphate, phosphate crude, and potassium-sodium-nitrate from the previous year.

U.S. exports Phosphate rock exports dropped 5 percent in 1974-75, the first decline since 1969-70 (table 7). Canada, Mexico, and Japan took nearly 7.5 million tons, or 56 percent of the total. These three, with eight other countries, took over 90 percent of phosphate rock exports. In addition, Colombia, Norway, France, Philippines, and India took from 100,000 to 270,000 tons of phosphate rock or 6.5 percent.

Potassium chloride and concentrated superphosphate exports in 1974-75 were over 1 million tons and ammonium phosphate over 2 million tons. Nearly a half million tons each of ammonium sulfate, urea, and mixed fertilizer were exported.

Anhydrous ammonia, ammonium nitrate, phosphate rock, normal superphosphate, and potassium chloride were the only materials exported which did not show gains in 1974-75 over the previous year (table 8). Anhydrous ammonia exports declined to a level 25 percent below the record export in 1968-69. Exports of ammonium phosphate have nearly doubled during the last 5 years.

About 24 percent of all plant nutrients exported in 1974-75 (excluding phosphate rock) went to countries with Agency for International Development (AID) agricultural programs compared to 23 percent in 1973-74 and 50 percent in 1972-73.

Table 5.--U.S. imports of selected fertilizer materials by country of origin, fertilizer year 1974-75 1/

Country of origin	Ammonium sulfate	Ammonium nitrate	Anhydrous ammonia	Urea	Calcium nitrate	Phosphate crude	Potassium chloride	Potassium sulfate	Potassium sodium nitrate	Mixed fertilizers
	-----Short tons of material-----									
Canada Mexico Trinidad Netherlands Antilles Chile	137,465	277,965	92,370 4,981 143,427 80,563	149,462 2,155 56,458	129	149 4,364 52,926	6,227,401	328	3,090	148,542
Norway United Kingdom Netherlands Belgium France West Germany	22,326	29,584	8,382 42,087 32,359	84,837 6,602 421,329 11,110 220	115,876 15 20		303		2,828 3,202	34,644 28,063 8,012 2,532 22
	43,788	3,271						40 14,534		
Spain Gaza Strip Israel Iran Venezuela Japan Australia Italy Kuwait Colombia Denmark Qatar United Arab Emirates China, Rep. of (Taiwan)	29,795	5,387		11,146 3,592			11,026	35,654		55,787
Austria Lebanon Dahomey Congo (Brazzaville) Total, other	6,302		14,301 15,971 54,141 50,179	51,721	331	22,420	805 67,534		7,267	
Total	218,232	316,227	598,292	811,842	116,160	79,879	6,358,650	50,556	16,387	290,949

1/ Other materials imported were the following: 438 tons dried blood; 2,659 tons manures, including guano; 58,550 tons calcium cyanamide; 201,520 tons sodium nitrate; 6,184 tons bone ash, dust, meal; 23,626 tons potassium nitrate; 189,945 tons ammonium nitrate-limestone; 91,669 tons nitrogen solutions; 109,327 tons nitrogenous fertilizer NSPF; 138,051 tons liquid phosphatic fertilizer; 61,282 tons solid phosphatic fertilizer NSPF; 2,031 tons potassic fertilizer NSPF; 247,017 tons ammonium phosphates; 115,191 tons fertilizer materials NSPF; and 238 tons basic slag.

Table 6.--U.S. imports of selected fertilizer materials, fertilizer years 1970-71 through 1974-75

Material	1970-71	1971-72	1972-73	1973-74	1974-75
-----Short tons of material-----					
Ammonium nitrate	365,943	390,324	329,243	301,169	316,227
Ammonium nitrate-limestone	62	134	181	208,776	189,945
Ammonium sulfate	218,752	263,559	276,183	273,061	248,232
Anhydrous ammonia	501,451	392,975	343,087	437,639	598,292
Calcium cyanamide	8,357	3,356	3,761	3,299	58,550
Calcium nitrate	48,293	39,314	97,702	184,574	116,160
Nitrogen solutions	194,494	119,540	144,762	166,304	91,669
Sodium nitrate	188,207	159,500	74,558	99,863	201,520
Synthetic nitrogenous material, net	12,661	35,438	20,743	212,821	109,327
Urea	329,640	365,218	671,714	668,316	811,842
Ammonium phosphate	471,779	488,865	433,737	396,757	247,017
Phosphate, crude	123,194	67,058	43,112	163,956	79,879
Phosphoric acid	37,215	90,662	89,490	106,432	138,051
Potassium chloride	4,115,291	5,082,283	5,250,338	6,766,582	6,358,650
Potassium-sodium nitrate	74,913	39,586	37,783	47,404	16,387
Potassium sulfate	62,732	48,042	54,456	73,911	50,556
Mixed fertilizers	198,307	188,473	198,311	232,105	290,949

Table 1.--U.S. exports of selected fertilizer materials by country of destination, fertilizer year 1974-75 1/

Country of destination	Ammonium sulfate	Ammonium nitrate	Anhydrous ammonia		Urea	Phosphate rock (all)	Normal super-phosphate	Concentrated super-phosphate	Ammonium phosphate	Phosphoric acid (P <sub>2</sub> O <sub>5</sub> ) (fact, grade)	Potassium chloride	Mixed fertilizers
			Fertilizer grade	Industrial								
Canada	31,408	7,455	15,875	1,751	5,828	3,975,256	18,232	18,305	83,946	4,059	4,371	178,975
Mexico	102,427	11,668	43,225	68,684	19,597	1,046,235	1,205	22	30,081	34	117,144	2,049
El Salvador 2/	101	455	26	13	8,485	6,098			11,778	12	3,082	11,463
Nicaragua 2/	42	89	12	70	6,378			307	50,211	103	7,122	27,254
Costa Rica 2/				21	6,378	5,842		1,668	31,403	18	26,126	4,740
Panama 2/				69	318			44	703	12	10,637	
Jamaica 2/	21,110	177	10	1,516				4,924	7,435		13,400	
Dominican Republic 2/	71,348	369	129	30	11,282	2,375	238	12,159	28,504	208	16,890	3,641
Trinidad	142	678	132	326	8,124	261	40	1,293	56	9	85	
North America, other 4/								505		20	327	4,969
Colombia 2/	54			52		100,221		21,603	24,254	31,741	15,685	72,636
Venezuela 2/				40		302		19,006	15,828	759	23,691	3,999
Ecuador 2/				4,745		9,279		4,817	48,184		120	188
Peru 2/					79	17,273		13,792	40,476	37	6,953	4,202
Chile 2/					3,011	84,418		154,431	58,437	58		
Brazil	128,042		50,943	8,301	13,758	518,088	109	290,586	334,851	87,496	191,728	1,929
Uruguay 2/	29		6		1,103			7,111	13,088		600	
Argentina		437		92	3,222	678	1,000	3,987	3,143	45	835	231
South America, other 4/										41	1,292	91,057
Sweden				12		49,007						
Norway				87		102,541		7,971	13	31	44	187
United Kingdom	20		21			81,699	198				32,127	
Ireland				2								
Netherlands						846,843				7,123		
Belgium				67	22	259,666			44,276		6	79
France	21			12	3,492	270,276		37,999	95,824	18,427		13,294
West Germany	21				26	799,092				243	11	10,046
Hungary								12,713				4,154
Poland						301,202		104,699				1
Spain			7,620	16		53,531				4	3,638	33
Italy				43		366,446		11,566	49,095	155		11,236
Romania			9,996			36,405				4		
Turkey 2/			10,251	2,127		67				12	5,511	818
Europe, other				18								
Lebanon				187								
Iraq	24			14	69	417,206		11,073	11,760		42	17
Iran						239,764						
Saudi Arabia				1				5,684				
India 2/ 3/	5,514			8				32,369	11,529			3
Philippines 2/ 3/					606			21,521	223,994		5,511	6,215
Bangladesh 2/ 3/				2								
Thailand 2/ 3/												
Afghanistan 2/ 3/												
South Vietnam 2/ 3/	997			327	96,710				58,870		1,825	12,646
Malaysia 2/	17			2							15,899	48
Indonesia 2/	228			20	145,038			178,402	134,548		45	
Philippines 2/	22,205	126		28	157,216			15,263	29,386	99	56,622	118
Korea, Republic of	114			56	23,085	615,563		94,613		509		1
China, Taiwan	34,471		24	74		54,118		32			38,786	15
Japan			51	603		2,475,473		11,912	97,759	78	74,401	4,293
Asia, other 4/			59		2,205	58		3,920	7,401	132	305	141
Australia	38			6,084		329			20	7,035	156,261	387
New Zealand	18					18			28,955	636	201,313	70
Oceania, other			15,169	17								
Algeria												
Ethiopia 2/												
Africa, other 4/	3,127	210										
Total	560,335	22,349	257,789	103,025	449,982	13,393,246	21,023	1,104,287	2,243,538	232,683	1,014,968	496,896
Countries with AID programs 2/	195,800	1,737	10,802	11,298	189,861	382,963	238	283,393	671,957	32,512	163,326	169,529
Percent to AID countries	35	8	4	11	42	3	1	26	30	14	16	33
Countries where AID financed at least part of fertilizer 2/	7,048	0	31	490	119,118	0	0	21,521	99,591	12	1,837	24,142

1/ Other exports: 3,799 tons sodium nitrate; 19,611 tons natural crude potash salts; 33,714 tons nitrogenous chemical fertilizer, nec; 826 tons basic slag; 350,144 tons potassium chemical fertilizers, nec; and 53,729 tons organic material.

2/ Countries with active AID agricultural programs.

3/ Countries which received AID financed fertilizer, but not necessarily all that was exported to each country.

4/ Includes AID and non-AID countries.



Table 8.--U.S. exports of selected fertilizer materials, fertilizer years 1970-71 through 1974-75

Material	1970-71	1971-72	1972-73	1973-74	1974-75
-----Short tons of material-----					
Anhydrous ammonia	598,426	420,865	693,857	532,067	257,789
Ammonium nitrate	58,621	33,742	21,425	36,964	22,349
Ammonium sulfate	600,833	557,562	485,950	557,474	560,335
Sodium nitrate	2,063	982	1,233	566	3,799
Urea	374,152	464,462	522,976	322,524	449,982
Synthetic nitrogenous materials n.e.c.	47,528	98,124	30,381	29,177	33,714
Phosphate rock	12,757,600	13,580,470	13,587,848	14,051,471	13,393,246
Normal superphosphate	17,637	13,637	46,712	25,114	21,023
Concentrated superphosphate	627,064	723,901	865,318	957,052	1,092,139
Ammonium phosphate	1,135,089	1,541,521	2,060,341	2,154,127	2,243,538
Potassium chloride	772,248	858,869	1,247,457	1,263,993	1,014,968
Potassium sulfate	238,047	211,366	240,306	272,345	350,144
Mixed fertilizers	317,338	243,022	372,692	437,247	496,896



Over 42 percent of the exported urea, 35 percent of the ammonium sulfate, 33 percent of the mixed fertilizer, 30 percent of the ammonium phosphate, and 25 percent of the concentrated superphosphate went to developing countries in which AID had active agricultural programs (table 7). AID financed fertilizer exports to only five of these countries. However, AID did not necessarily finance all the fertilizer exported to these countries.

U.S. historical trade balance - The United States shifted from a net importer of nitrogen (N) to a net exporter in 1966 (table 9). The shift resulted primarily from the increased emphasis on the use of fertilizers in the AID program. A reduction in AID requirements in 1969-70 caused the first decline in N exports since 1962-63. The decline was reversed in 1972-73 by the worldwide food shortage and the need to increase food production. The United States shifted to a net importer of N in 1974-75 due primarily to limited availability of foreign exchange for fertilizer purchases and world economic conditions. However, the United States is expected to again become a net exporter in 1975-76.

The United States has maintained an export balance of processed phosphatic fertilizers since 1941. Export levels went up as AID requirements increased. Exports peaked in 1967-68. A decline, which started in 1968-69, was halted in 1970-71 largely as a result of firms in several countries purchasing concentrated superphosphate and ammonium phosphate to start developing markets for plants which were under construction. The world food situation further emphasized the need for  $P_2O_5$ , and exports increased 19 percent in 1974-75 and are expected to be near the same level in 1975-76.

U.S. exports accounted for about 34 percent of processed fertilizer  $P_2O_5$  in world trade in 1973-74. In addition, the United States has exported 12 to 14 million tons of phosphate rock in each of the past 5 years.

The United States had an export balance of  $K_2O$  from 1955-56 through 1961-62. Production from the then newly developed Canadian deposits shifted the net balance to imports in 1962-63. Since 1969-70, domestic production of potassium chloride (KCl) has been smaller than the import of KCl from Canada.

For the three primary fertilizer nutrients combined, the United States imported 5,319,000 tons and exported 3,850,000 tons in 1974-75. The United States expected to import 4,730,000 tons and export 3,803,000 tons of these nutrients in 1975-76.

Table 9.--U.S. imports and exports of primary plant nutrients, 1951-52 through 1975-76

Fertilizer	N		P <sub>2</sub> O <sub>5</sub>		K <sub>2</sub> O	
	Imports	Exports	Imports	Exports	Imports	Exports
1951-52	290	73	39	94	264	63
1952-53	429	44	41	74	159	54
1953-54	421	62	62	88	121	54
1954-55	373	141	61	154	139	91
1955-56	330	255	56	153	170	180
1956-57	294	268	54	256	179	315
1957-58	305	227	59	246	213	252
1958-59	294	223	64	204	238	310
1959-60	298	188	82	177	282	418
1960-61	276	213	67	238	285	484
1961-62	337	234	87	283	282	503
1962-63	344	196	117	275	486	411
1963-64	453	264	100	400	691	526
1964-65	470	392	98	432	884	625
1965-66	529	546	125	441	1,332	664
1966-67	669	749	165	787	1,643	678
1967-68	675	1,045	169	1,145	2,225	714
1968-69	690	1,594	183	995	1,944	798
1969-70	855	1,328	273	845	2,646	681
1970-71	929	1,077	283	898	2,510	620
1971-72	843	1,032	326	1,102	3,088	657
1972-73	882	1,508	312	1,422	3,192	922
1973-74	1,068	1,269	315	1,581	4,114	947
1974-75	1,198	1,118	274	1,882	3,850	848
1975-76 *	1,024	1,137	194	1,850	3,431	817

\* Estimated.

--- Import Balance

--- Export Balance

## THE WORLD FERTILIZER MARKET

World food shortages have intensified the interest in fertilizer as a means of increasing crop yields and thereby increasing total food production. Fertilizer is an important means for increasing needed food production in developing as well as developed countries.

World production of primary plant nutrients totaled about 88 million metric tons <sup>1/</sup> in 1973-74 (latest year for which world fertilizer data are available), an increase of about 7 percent over 1972-73 and about 38 percent over 5 years ago (tables 10, 11, and 12). Consumption totaled over 84 million tons in 1973-74, a 9-percent increase over 1972-73 and 42 percent over 5 years ago.

The United States ranked number one in total use of each of the primary plant nutrients and the production of N and P<sub>2</sub>O<sub>5</sub> in 1973-74. It produced 20 percent of the world's plant nutrients and used 21 percent of them in 1973-74.

Nitrogen (N) - In 1973-74, the United States produced 23 percent of the world's supply of N for fertilizer, consumed 21 percent, and ranked number two as an importer and number one as an exporter (table 10). China ranked number one as an importer. However, its imports have declined the past 3 years.

India, an AID participant, ranked third as an importer, tenth as a producer, and fourth as a consumer. Indonesia, the only other AID participant in the top ten, ranked seventh as an importer. Half of the top ten importers were developing countries. Japan, the Netherlands, Belgium, Norway, and Romania each exported more N than was used at home.

Phosphate (P<sub>2</sub>O<sub>5</sub>) - The United States continued in 1973-74 as the leading producer, consumer, and exporter of P<sub>2</sub>O<sub>5</sub>, (excluding phosphate rock) (table 11). It produced 24 percent and consumed 19 percent of the world's fertilizer P<sub>2</sub>O<sub>5</sub>. Four of the top ten importers are developing countries. India, the only AID participant in the top ten, ranked fifth as an importer and tenth as a consumer. Belgium, the Netherlands, and Morocco exported more P<sub>2</sub>O<sub>5</sub> than was used at home.

Potash (K<sub>2</sub>O) - The United States ranked fifth as a producer, sixth as an exporter, but first as an importer and consumer of K<sub>2</sub>O in 1973-74 (table 12). The U.S.S.R. continued as the leading producer and ranks second as a consumer and as an exporter.

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<sup>1/</sup> Multiply metric tons by 1.1023 to convert to short tons.

Table 10.--Nitrogen: N production, consumption, and foreign trade by leading countries, 1973-74

Country	Production		Imports		Exports		Consumption	
	Metric tons N	Rank	Metric tons N	Rank	Metric tons N	Rank	Metric tons N	Rank
United States	9,152,000	1	959,000	2	1,516,721	1	8,276,972	1
USSR	7,241,000	2	5,000 <u>1/</u>	-	199,800	-	6,256,000	2
China	2,731,000 <u>1/</u>	3	1,126,000 <u>1/</u>	1	40,000 <u>1/</u>	-	3,815,000 <u>1/</u>	3
Japan	2,162,000	4	28,200 <u>1/</u>	-	1,320,000	2	821,000	9
France	1,636,364	5	235,530	10	187,406	-	1,833,083	5
West Germany	1,472,967	6	237,100 <u>1/</u>	9	524,182	5	1,100,841	6
Poland	1,365,588	7	6,858	-	401,479	7	1,069,171	7
Netherlands	1,212,741	8	50,730	-	909,107	3	396,688	-
Italy	1,111,110	9	39,335	-	401,347	8	672,178	-
India	1,050,000	10	726,000	3	-----	-	1,835,000	4
Romania	854,000	-	-----	-	434,000 <u>1/</u>	6	419,600	-
Canada	789,000	-	24,400	-	312,000	10	498,000	-
Spain	773,154	-	27,900	-	-----	-	716,219	10
United Kingdom	755,400	-	121,200	-	85,000	-	874,400	8
Belgium	652,312	-	118,494	-	549,884	4	165,225	-
Norway	444,700	-	-----	-	362,600	9	85,300	-
Denmark	83,200 <u>1/</u>	-	255,000 <u>1/</u>	8	-----	-	365,000 <u>1/</u>	-
Indonesia	91,000 <u>1/</u>	-	255,000	7	-----	-	350,000 <u>1/</u>	-
Brazil	165,300 <u>1/</u>	-	316,000 <u>1/</u>	5	1,300	-	425,000 <u>1/</u>	-
Egypt	50,800 <u>1/</u>	-	260,000 <u>1/</u>	6	-----	-	380,000 <u>1/</u>	-
Turkey	135,000	-	450,700	4	-----	-	429,900	-
Total, other	6,569,283	-	2,712,639	-	776,816	-	7,872,234	-
World Total	40,497,919		7,955,086		8,021,642		38,656,811	

1/ Unofficial figures.

Source: Annual Fertilizer Review 1974, Food and Agriculture Organization of The United Nations.



Table 11.--Phosphate: P<sub>2</sub>O<sub>5</sub> production, consumption, and foreign trade by leading countries, 1973-74

Country	Production		Imports		Exports		Consumption	
	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank
United States	6,013,000	1	287,000	3	1,412,000	1	4,499,951	1
USSR	3,236,000	2	206,000	6	92,300	9	2,699,000	2
France	1,693,291	3	403,481	1	126,150	7	2,152,429	3
China	1,314,300	4	77,800	1/	2,400	1/	1,389,700	4
Australia	1,168,900	5	1,700	1/	-----	-----	1,170,600	5
West Germany	962,107	6	130,071	8	181,498	6	916,740	6
Poland	813,641	7	383	-----	35,856	-----	847,228	7
Japan	735,800	8	58,700	-----	25,300	-----	792,900	8
Canada	720,000	9	36,800	-----	304,500	5	480,000	-----
Austria	628,872	10	32,971	-----	71,370	-----	115,748	-----
United Kingdom	417,000	-----	60,100	-----	77,900	10	478,200	-----
Netherlands	349,766	-----	85,694	9	345,893	4	106,950	-----
Brazil	347,000	1/	318,203	2	3,062	-----	725,000	1/
India	325,000	-----	256,000	5	-----	-----	634,000	-----
Hungary	194,900	1/	139,800	7	-----	-----	322,174	-----
Morocco	170,000	1/	82,000	10	120,700	1/	45,000	1/
Bulgaria	134,832	-----	281,000	4	-----	-----	258,719	-----
Turkey	-----	-----	64,821	-----	-----	-----	280,000	-----
Belgium	-----	-----	1,385,470	-----	487,710	2	165,680	-----
Total, other	5,922,302	-----	-----	-----	4,855,703	-----	6,075,063	-----
World Total	25,146,711	-----	3,907,994	-----	8,021,642	-----	24,255,082	-----

1/ Unofficial figures.

Source: Annual Fertilizer Review 1974, Food and Agriculture Organization of The United Nations.



Table 12.--Potash: K<sub>2</sub>O production, consumption, and foreign trade by leading countries, 1973-74

Country	Production		Imports		Exports		Consumption	
	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank	Metric tons	Rank
USSR	5,918,000	1	-----	-	1,996,800	2	3,605,000	2
Canada	5,072,500	2	45,000	-	5,234,600	1	205,000	-
East Germany	2,556,000	3	-----	-	1,819,000	3	658,300	7
West Germany	2,538,928	4	90,452	-	1,383,457	4	1,163,345	5
United States	2,346,000	5	3,741,000	1	859,000	6	4,613,610	1
France	2,082,404	6	464,552	-	951,223	5	1,818,842	3
Israel	514,840	7	-----	-	427,090	7	11,395	-
Spain	473,069	8	-----	-	155,870	8	264,600	-
China	300,000 <sup>1/</sup>	9	227,800 <sup>1/</sup>	-	-----	-	527,800 <sup>1/</sup>	9
Congo	263,000 <sup>1/</sup>	10	4,000 <sup>1/</sup>	-	-----	-	4,000 <sup>1/</sup>	-
Italy	137,073	-	197,744	-	22,553	9	267,433	-
Poland	-----	-	1,346,316	2	-----	-	1,413,347	4
Japan	-----	-	612,800	3	-----	-	684,900	6
Czechoslovakia	-----	-	576,000	4	-----	-	576,000	8
Brazil	-----	-	523,298	5	-----	-	523,154	10
United Kingdom	-----	-	487,600	6	-----	-	497,800 <sup>1/</sup>	-
India	-----	-	386,000	7	-----	-	314,000	-
Hungary	-----	-	378,000 <sup>1/</sup>	8	-----	-	387,284	-
Belgium	-----	-	361,051	9	-----	-	192,922	-
Netherlands	-----	-	218,848	10	-----	-	114,065	-
Total, other	19,738	-	3,033,974	-	223 9,852	10 -	2,843,698	-
World Total	22,221,552		12,694,435		12,859,668		20,686,495	

<sup>1/</sup> Unofficial figures.

Source: Annual Fertilizer Review 1974, Food and Agriculture Organization of The United Nations.

Eleven countries are currently the world's significant sources of  $K_2O$  for fertilizers. Of the eleven, 70 percent of Canada's total export of  $KCl$  went to the United States. Israel exports about 83 percent, while East Germany exports about 71 percent of its production. West Germany and France export about half, while Spain, the United States, and the U.S.S.R. each export about a third of their production.

Of the major producers, Canada, West Germany, East Germany, and Israel exported more  $K_2O$  than was used at home. Poland, Japan, Czechoslovakia, Brazil, the United Kingdom, India, Hungary, Belgium, and the Netherlands, in order, are the top ten importers after the United States. The first four of these are among the top ten users of  $K_2O$ .

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